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2 April 1976

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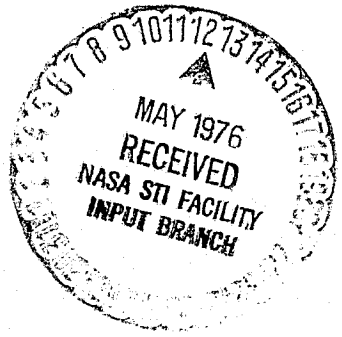

Sam L. Pool, M.D.
Medical Application Office
Code: DE6
Lyndon B. Johnson Space Center
Houston, Texas 77058

Dear Dr. Pool:

Subject: Final Report and Completion of Contract NAS9-14321
"Biomedical Applications Engineering Tasks"

Four copies of the final report are attached and six others have been dissiminated in accordance with the contract. The Technical Support Packages which were previously delivered are identified in the final report; four additional copies of each are attached.

Please note in the final report that the Damped Orthosis, Item 3, is currently in use at Cerebral Palsy Treatment Center in San Antonio. We recommend that the delivery requirement for this apparatus be modified so that training and evaluation by S.A.C.P. can proceed without interruption. See Section II of the final report.

The invention disclosure for the Damped Orthosis will be sent on or before 9 April. This will complete our commitments as specified in Contract NAS9-14321.

Sincerely,

W. Lyle Donaldson
Sr. Vice President and
Director, Department of Bioengineering

WLD:wbs
attachment

(NASA-CR-147584) BIOMEDICAL APPLICATIONS ENGINEERING TASKS Final Report (Southwest Research Inst.) 7 p HC $3.50 CSCL 06B

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FINAL REPORT
Contract No. NAS9-14321
SwRI Project 13-4059

BIOMEDICAL APPLICATIONS ENGINEERING TASKS

Prepared For

Medical Applications Office
Lyndon B. Johnson Space Center
National Aeronautics and Space Administration

2 April 1976

APPROVED:

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TABLE OF CONTENTS

I. INTRODUCTION

The engineering tasks performed in this program were in response to needs articulated by clinicians. Initial contacts were made with these clinician-technology requestors by the Southwest Research Institute NASA Biomedical Applications Team under Contract NAS9-13775. The basic purpose of the program was to effectively transfer aerospace technology into functional hardware to solve real biomedical problems.

II. SUMMARY

The following devices were designed, fabricated and tested at SwRI.

Item No.	Description
1	Apparatus for measuring tactile spatial separation (aesthesiometer)
2	Beta radiation catheter probe
3	Rigid lightweight structure for a damped orthosis (athetoid restraint device)
4	Rate monitor for self-injurious behavior
5	Nocturnal activity monitor

Technical Support Packages (TSP's) were submitted to the contracting officer for each item. The appropriate TSP defines the clinical problem and identifies NASA technology used in development of devices for clinical application and evaluation. The TSP also provides technical details and operating characteristics of the device.

All hardware items were delivered to Johnson Space Center with exception of Item 3, Rigid lightweight structure for a damped orthosis. The orthosis is awaiting clinical use and evaluation at the Cerebral Palsy Treatment Center in San Antonio. Since delivery to Johnson Space Center at this time would interrupt the training and evaluation procedure, SwRI recommends that JSC waive the delivery requirement and authorize the CP Center to proceed with evaluation.

III. APPLICATIONS ENGINEERING TASKS

A. Task I. Apparatus for Measuring Tactile Spatial Separation (Aesthesiometer)

The functional device was completed and delivered with the Technical Support Package entitled "Description and Operating Instructions for Aesthesiometer Device."

B. Task II. Beta Radiation Catheter Probes

Six functional catheter units were delivered. Substantial time delays in performance of this task were experienced because of slow delivery of the beta elements by the vendor. See the Technical Support Package entitled "Beta Radiation Catheter."

C. Task III. Rigid Lightweight Structure for a Damped Orthosis

This apparatus was developed in an iterative process which involved clinical trials at the San Antonio Cerebral Palsy Treatment Center with engineering modifications at SwRI. A NASA JSC filming crew documented early clinical trials and will likely shoot comparative followup footage after the test subject has demonstrated improvements due to use of the device. Since interruptions could invalidate on-going training and evaluation, SwRI has recommended that the delivery requirement be waived entirely or delayed until clinical evaluation has been completed. See the TSP entitled "A Rigid Lightweight Structure for a Damped Orthosis."

D. Task IV. Rate Monitor for Self-Injurious Behavior

A functional device was delivered early in the program. See the Technical Support Package entitled "Self-Injurious Behavior."

E. Task V. Nocturnal Activity Monitor

A functional device was delivered early in the program. See the Technical Support Package entitled "Nocturnal Activity Monitor."